

CARNATION ETCHED RING

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Carnation is one of the most popular and widely grown flower crops. Because commercial varieties are propagated by cuttings, pathogens may easily be carried on and in the propagative parts and likewise shipped world-wide. The threat of this prospect has led to the establishment of programs to index cutting sources for the presence of pathogens. Tissue culture and thermotherapy have been used successfully to free carnations from certain pathogens.

Carnation etched ring, a virus disease, is found in nature only in carnation, *Dianthus caryophyllus* L. It has been found world-wide.

SYMPTOMS. Etched ring disease is characterized by necrotic flecks, rings, and lines on carnation leaves (fig. 1). This symptom development is temperature-dependent, but symptoms are usually most conspicuous in young vegetative growth. The virus is transmissible by mechanical inoculation, by the aphid *Myzus persicae*, and spread by infected cuttings (2).



Fig. 1. Carnation etched ring on carnation, showing the characteristic necrotic lines and rings.



Fig. 2. Spherical inclusion bodies produced by carnation etched ring virus in carnation epidermal cells.

THE PATHOGEN. The genetic and infectious component of most plant viruses is ribonucleic acid (RNA). Carnation etched ring virus is unusual in that it contains deoxyribonucleic acid (DNA). This virus, cauliflower mosaic virus, dahlia mosaic virus, mirabilis mosaic virus, and strawberry vein banding virus are DNA viruses of plants (3, 4). Collectively, they are referred to as caulimoviruses.

DIAGNOSIS AND CONTROL. This virus induces symptoms which are not easily distinguished from those caused by other carnation viruses. Thus, other means of diagnosis are required. One of the best methods of diagnosis is by the observation, through a light-microscope, of distinctive inclusion bodies (1) (fig. 2). The index plant *Saponaria vaccaria* may also be useful in diagnosis; however, other carnation viruses may also infect this host and perhaps mask the presence of carnation etched ring virus.

Prevention of introduction of this virus is the most effective method of control. This may be achieved by obtaining cuttings from stock plants known to be free from this virus. Virus infected plants should be destroyed since they may serve as a source of infection.

SURVEY AND DETECTION. Necrotic flecks, rings, and lines may indicate the presence of this or other carnation viruses. Because etched ring virus is transmitted in infected cuttings, the symptoms are often restricted to certain cultivars.

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